

5.6 Solving Exponential & Logarithmic Equations

Name _____ Date _____ Period _____

Review: Solve the given equations. Show all work!

1. $x^2 - 7x - 30 = 0$

2. $(x+3)^2 - 4(x+3) + 3 = 0$

Solve each logarithmic equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places. Show all work!

3. $\log_4 x = 2$

4. $\log_4(x+2) = \log_4 8$

5. $\frac{1}{2} \log_3 x = 2 \log_3 2$

6. $2 \log_3(x+4) - \log_3 9 = 2$

7. $\log x + \log(x+15) = 2$

8. $\log_2(x+7) + \log_2(x+8) = 1$

9. $\log_5(x+3) = 1 - \log_5(x-1)$

10. $\ln x + \ln(x+2) = 4$

Solve each exponential equation. Express irrational solutions in exact form and as a decimal rounded to three decimal places. Show work!

11. $2^{x-5} = 8$

12. $8^{-x} = 1.2$

13. $3^{1-2x} = 4^x$

14. $\left(\frac{3}{5}\right)^x = 7^{1-x}$

15. $3^{2x} + 3^x - 2 = 0$

16. $2^{2x} + 2^x - 12 = 0$

17. $\frac{e^x + e^{-x}}{2} = 1$ (Hint: Multiply both sides of the equation by e^x .)

18. The value of a Honda Civic DX that is t years old can be modeled by $V(t) = 16,775(0.905)^t$.

According to the model, when will the car be worth \$15,000? \$8,000? \$4,000? Show work!